

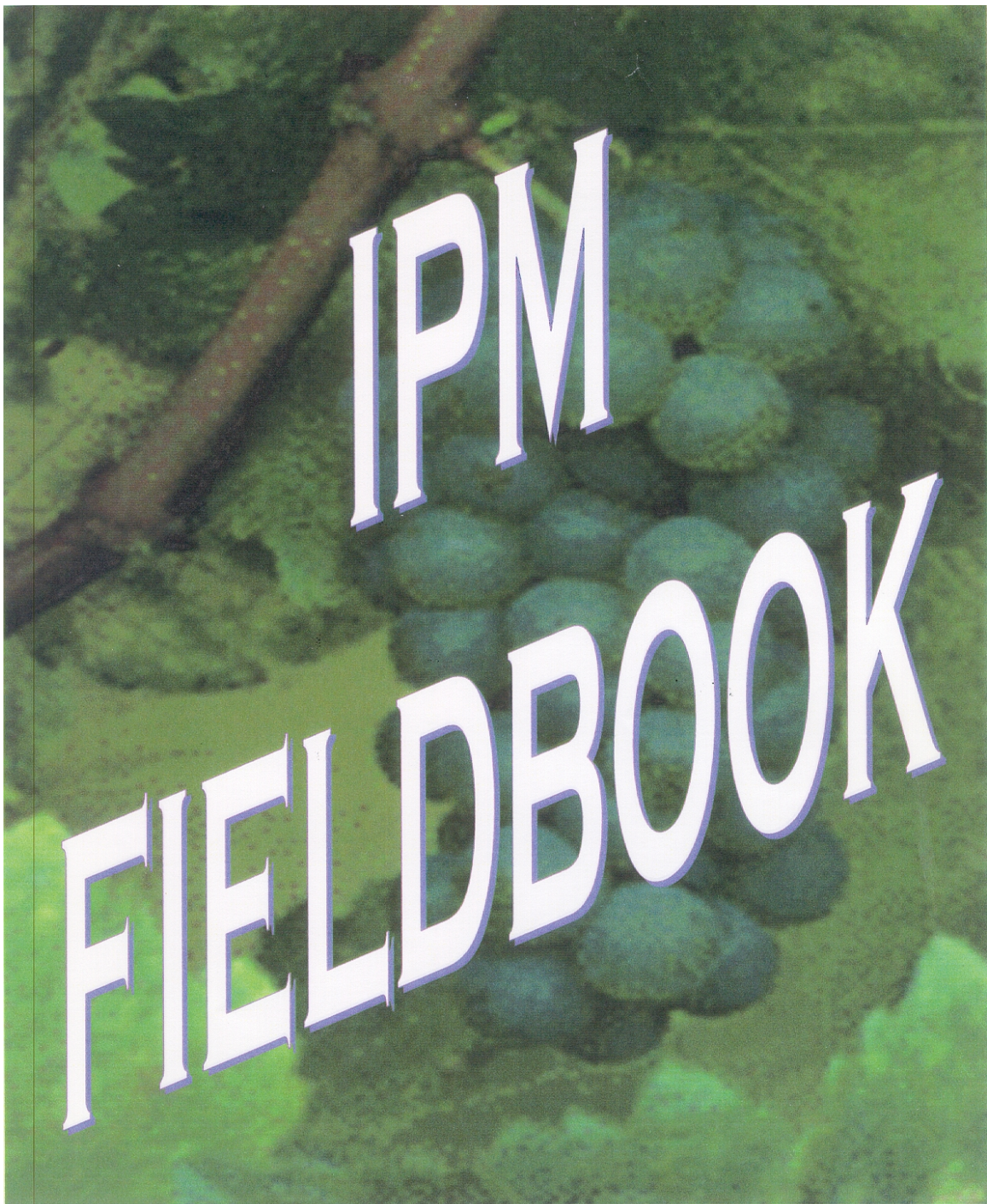
IPM Fieldbook

Cover page

Letter of Introduction

Pest Monitoring Section

IPM Resources Section



Sonoma County Grape Growers Association

Welcome to the Sonoma County Grape Growers' Association's IPM Fieldbook

Within the modest width of this binder you will find a work designed to enhance your pest management program, and expand and refine your current IPM practices. The materials have been developed by the SCGGA's IPM (Integrated Pest Management) Project and essential references have been gleaned from local and state sources for their functional, vital nature in assisting growers with good pest management practices. From the bright Pest I.D. Sheets to the Fieldlog Monitoring Reports, this handy IPM Fieldbook will likely be a favorite tool for your dedication to excellence in winegrowing and IPM.

The IPM Fieldbook is broadly divided into two sections; the first is to be used directly for field monitoring and the second is a compendium of IPM resources.

The monitoring section is intended to be a companion to the Grower Appellation Meetings sponsored by the SCGGA's IPM Project through a grant from California's Department of Pesticide Regulation. In the monitoring section you will find seven Pest I.D. Sheets plus four Sheets in Spanish, each of which outlines the key elements of a major pest with pictures of the pest and the damage, and a calendar of monitoring techniques that will provide the best information for IPM practices.

Also in the monitoring section are blank Fieldlog Monitoring Reports. These reports will allow you to record pest activity and damage in a way that is consistent with protocols being developed by the SCGGA's IPM Project. The Fieldlog Monitoring Reports can be entered into the SCGGA's central IPM Fieldlog (a computer database), or can be used as stand-alone monitoring sheets for your vineyards. If you choose to forward your Pest Monitoring Reports to the IPM Fieldlog, you will discover a powerful instrument for making informed pest management decisions.

The IPM resource section of this Fieldbook offers the most requested and referred to items from the Grower Appellation Meetings. Included are: the list of diagnostic laboratories and the suppliers of yellow sticky traps, both compiled by Rhonda Smith; the University of California's Agricultural Publications catalog (you can order the Natural Enemies Handbook, or Cover Cropping in Vineyards, or the Grower's Weed Identification Handbook, or Vineyards in an Oak Landscape, etc.); and a number of other references.



The Sonoma County Grape Growers' Association considers this Fieldbook to be an interactive work-in-progress and invites you to attend the Grower Appellation Meetings, use the Monitoring Reports and give your input regarding this Fieldbook to help our winegrowers have the best tools in the industry.

P.O. Box 1959 • Sebastopol, California 95473-1959 • (707) 829-3963

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Sharpshooters

Phomopsis

Powdery Mildew

Botrytis

La Chicharrita De La Vid

Aranitas

Chicharritas

Cenicilla Polvorienta

IPM Resources Section

- Retail Sources of Yellow Sticky Traps
- Selected Commercial Laboratories for Soil, Water, Plant, and Pest Testing
- Sonoma County Viticultural Area Maps order form
- U.C. Agriculture & Natural Resources Publications catalog

Grower _____

Fieldlog Monitoring Report

Block _____

Date _____

Vineyard Sector

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Pest**Grape Leafhopper**

(nymphs/leaf)

--	--	--	--

Hopper Leaf Damage0 - none 1 - lt. 2- lt. to mod.
3 - mod. 4 - app. thresh 5 -
Rx needed

0-5	0-5	0-5	0-5
-----	-----	-----	-----

Willamette Mite

(% infested leaves)

--	--	--	--

Pacific Mite

(% infested leaves)

--	--	--	--

Mite Predators

(% leaves with predators)

--	--	--	--

Mite Damage Rating0 - none 1 - lt. 2- lt. to mod.
3 - mod. 4 - app. thresh 5 -
Rx needed

0-5	0-5	0-5	0-5
-----	-----	-----	-----

Thrips

(% count shoots)

--	--	--	--

Powdery Mildew0 - none 1 - lt. 2- lt. to mod.
3 - mod. 4 - mod. to sev. 5 -
severe

0-5	0-5	0-5	0-5
-----	-----	-----	-----

Botrytis0 - none 1 - lt. 2- lt. to mod.
3 - mod. 4 - app. thresh 5 -
Rx needed

0-5	0-5	0-5	0-5
-----	-----	-----	-----

Phomopsis0 - none 1 - lt. 2- lt. to mod.
3 - mod. 4 - app. thresh 5 -
Rx needed

0-5	0-5	0-5	0-5
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Canopy Water Status

G = Green

DG = Dull Green

Y = Yellow

D = Defoliating

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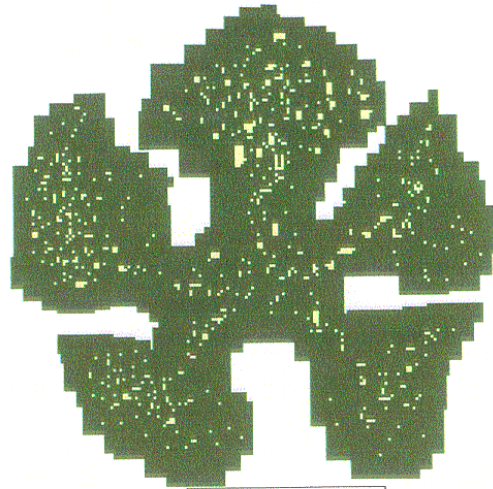
Trap Number**1****2****3****4****Blue-Green SS**

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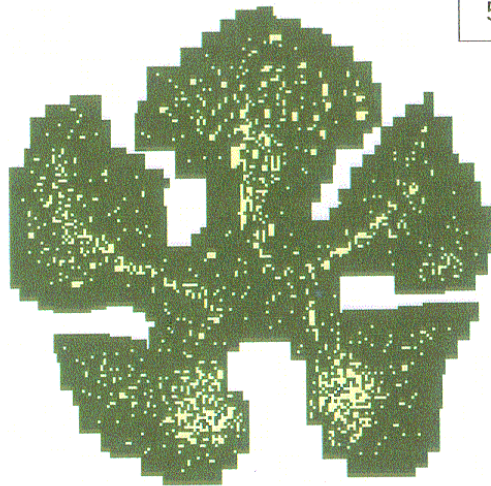
Glassy-Winged SS

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Notes:**Phenology: Bud Break Bloom Fruit Set Bunch Close Veraison****Inches of Growth:** _____



5% damage



10% damage



15% damage

Vineyard Pest and Disease Monitoring Documents

These documents are the final draft documents that have been shared with growers, managers and workers in English and in Spanish at this years' Grower Appellation Meetings. The document for Botrytis was completed and distributed also. These documents were also included in the new IPM Fieldbook.

Western Grape Leafhopper



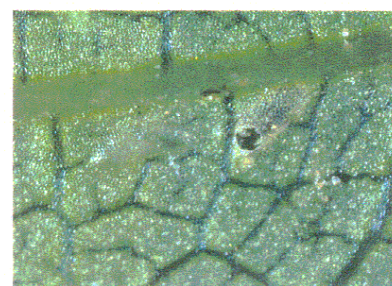
Adult

- 1/8 inch long
- Pale yellow with reddish and brown markings
- Overwinter as adults



Cast-off skin

- Fifth nymphal stage molts leaving cast-off skin on leaf
- Indication that adults are emerging



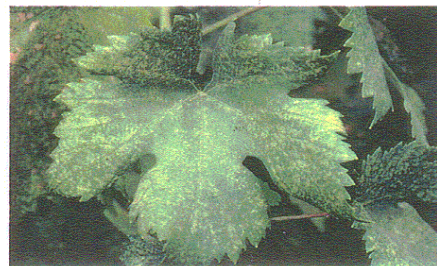
Egg Parasite

- Right: Round exit-hole from emerged parasite
- Left: unparasitized egg



Nymphs

- Five immature nymphal stages
- Small: 3/64 to 5/64 inch long
- Crab-like sideways movement



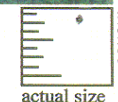
Damage

- Stippling on leaves
- As damage increases, leaf turns pale yellow
- Leaves may dry up and fall



Anystis agilis

- The predatory mite anystis attacks grape leafhopper nymphs



Western Grape Leafhopper

Date	Insect Stage	What to look for
Early to mid-May	<ul style="list-style-type: none"> First nymphal stage of first brood 	<ul style="list-style-type: none"> Divide block into sampling areas Nymphs on lower surface of basal leaves (nodes # 1-5) Stippling damage on basal leaves Sample 1 basal leaf per vine that has damage Count and record nymphs per leaf on total of 10 leaves per sampling area once a week Record average nymphs/leaf
Early to mid-June	<ul style="list-style-type: none"> Peak number of nymphs of first brood 	<ul style="list-style-type: none"> Same as above Estimate vine canopy damage Look for parasite exit-holes in <u>grape leafhopper eggs</u>
Mid to late June	<ul style="list-style-type: none"> Cast-off skins 	
July	<ul style="list-style-type: none"> Second brood nymphs 	<ul style="list-style-type: none"> Nymphs on lower surface of leaves at mid-shoot Sample one mid-shoot leaf per vine that has damage Count and record number of nymphs/leaf on mid-shoot leaves once per week Estimate vine canopy damage
Pre-harvest	<ul style="list-style-type: none"> Adults of second generation 	<ul style="list-style-type: none"> Assess adult population

Thrips



Western Flower Thrips

- Approximately 1/25 inch long
- Tubular shaped
- Adults with feathery wings
- Front end of the head is square with a pair of red eyes at the corners, and a pair of antennae in the middle



Grape Thrips

- Appearance similar to western flower thrips



Early Season Shoot Damage

- Early spring damage when shoots are less than 12 inches long
- Shorter internodes
- Stunted growth



Mid-season damage:

- Mis-shapen basal leaves



- Scarred canes with shorter internodes



Left: Normal shoot. Right: Early spring thrips dam



Predators: Minute pirate bug nymph

- Nymphs are cream-colored and oval shaped
- Long piercing mouth parts
- As name implies, they are very small, a bit larger than the thrips



Predators: Minute pirate bug adult

- Adults have black and white pattern on wings



Thrips

Date	Insect Stage	What to look for
Budbreak through April	Adults and immatures	<ul style="list-style-type: none">• Stunted shoot growth immediately after budbreak• At budbreak watch for scarring at the tips of the tiny, immature leaves. Peel back these leaves and with a hand lens look for thrips.• If shoot growth is delayed due to cold weather, thrips damage may be more apparent.• When shoots are short, inspect for thrips on the developing leaves at the tip of the shoot.• When shoots can be bent without damage, sharply tap the tip of the shoot onto a hard white surface. Look for fast moving elongated insects.

Spider Mites



Willamette spider mite

- 1/50 inch long
- First pair of legs is translucent or pale yellow
- Minute food spots present at the side of the body



Willamette mite damage

- Mite colonies tend to reside along veins on underside of leaf
- Damage begins as yellow discoloration on upper leaf surface adjacent to veins
- Seek less exposed (shaded) leaves of canopy causing foliage to turn yellow or bronze
- Produce very little webbing

*Sonoma County Grape Growers Association
Photos by Jack Clark, University of California*



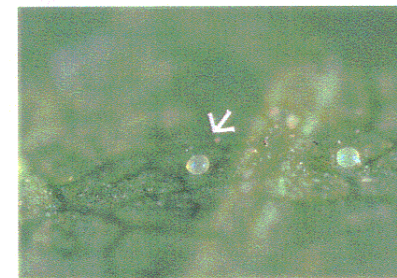
Pacific spider mite

- 1/50 inch long
- Vary in color from slightly amber to greenish or reddish
- Dark food spots present at the side of the body



Pacific mite damage

- Mite colonies have clumped distribution and are found on the underside of leaves
- Damage begins as yellow spot on upper leaf surface
- Damage progresses, especially in hot weather, by turning leaves dry and brown
- Mites prefer exposed part of canopy, particularly top shoots and the sides of the vine facing afternoon sun



Spider mite eggs

- Left: Willamette mite egg showing hair papilla (arrow)
- Right: Pacific mite egg



Western predatory mite

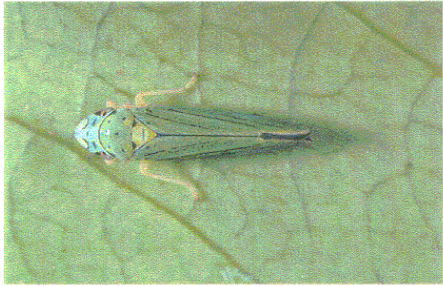
- Body is tear-drop or pear shaped
- Color varies from translucent white to slightly reddish
- Mature predatory female mites are slightly larger than adult female spider mites
- Predatory mites constantly search for prey, move rapidly on the leaf and probe with the first pair of legs in rapid up and down waving motion
- They are often found resting in vein angles

Version 2001

Spider Mites

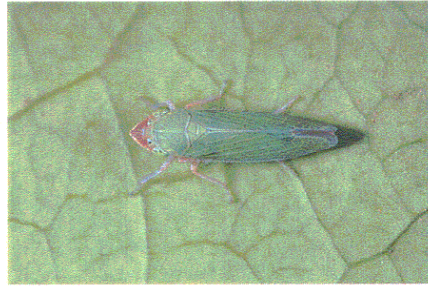
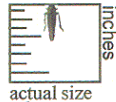
Date	Insect Stage	What to look for
April through harvest	<ul style="list-style-type: none"> • Willamette spider mites • Pacific spider mites • Western predatory mites 	<ul style="list-style-type: none"> • Divide vineyard into more than one sampling area, as weak areas need more monitoring • Select 10 vines to sample • From each vine select a leaf with damage • Examine the lower surface of the leaf with a hand lens • Distinguish between Willamette and Pacific mite by the color of the adult front legs • Search carefully along veins and in leaf areas that are depressed or cupped • Record presence or absence of Willamette/Pacific spider mites and Western predatory mites. One or more mites constitutes "presence". No mites constitute "absence" • Tally the number of leaves with one or more spider mites • Tally the number of leaves with one or more predaceous mites • Divide the number of leaves with spider mites by the total number of leaves sampled to obtain percent infestation • Divide the total number of leaves with spider mites by the total number of leaves with predatory mites to obtain the ratio of spider mites to predatory mites

Sharpshooters



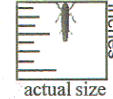
Blue-green sharpshooter

- 1/4 inch long
- Dark green to bluish green
- Black markings on back of head and thorax
- Yellow triangle between the wings
- One generation per year
- Feeds and breeds on woody plants



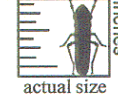
Red-headed sharpshooter

- 1/5 inch long
- Green wings and thorax
- Sharply pointed head with reddish color
- Four generations per year
- Breeds and feeds on bermuda grass



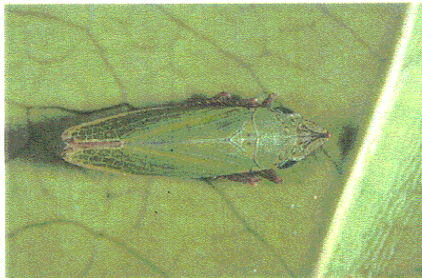
Glassy-winged sharpshooter and egg mass

- 1/2 inch long
- Dark brown with light underside
- Upper part of head stippled with yellow spots
- Wings partly transparent with reddish veins, folded flat over the body
- Breeds and feeds on woody and herbaceous plants



Blue-green sharpshooter nymph

- Five immature nymphal stages
- White in color



Green sharpshooter

- 5/16 inch long
- Green on the top side
- Tan to dark brown legs and underside
- Three generations per year
- Breeds and feeds on grasses



Glassy-winged sharpshooter nymph

- Five immature nymphal stages
- Olive-gray in color with prominent reddish eyes

Sharpshooters

Blue-Green Sharpshooter

Date	Insect Stage	What to look for
March through May	• Blue-green sharpshooter adult	<ul style="list-style-type: none"> • Before budbreak, place yellow sticky cards at least 4 by 7 inches in size at the edge of the vineyard adjacent to a riparian zone, wooded areas or landscape. • Place traps 100 to 200 feet apart • Check traps at least once a week • Remove insects from the trap after counting them • Replace traps whenever they become dirty or are no longer sticky
Mid-April Through July	• Blue-green sharpshooter nymphs	<ul style="list-style-type: none"> • Look for BGSS nymphs in their preferred host plants at the edge of the vineyard • Sample host plants with the use of a sweep net • Empty the contents of the sweep net in a plastic bag for viewing

Glassy-Winged Sharpshooter

Date	Insect Stage	What to look for
March through November	Glassy-winged sharpshooter adult	<ul style="list-style-type: none"> • Before budbreak, place yellow sticky cards (preferably 5.5 by 9 inches in size) at the edge of the vineyard adjacent to a riparian zone, wooded areas or landscape • Place as many traps as you can check on a weekly basis • Check traps at least once a week and keep a record • Replace traps whenever they become dirty or are no longer sticky

Green and Red-headed Sharpshooters*

Date	Insect Stage	What to look for
April through May	• Green sharpshooter adult	• Sample lush grasses with a sweep net
	• Red-headed sharpshooter adult	• Sample bermudagrass with a sweep net

* Green and red-headed sharpshooters are found where grasses remain lush year round. In the north coast vineyards, adjacent to their breeding habitat, these sharpshooters can be a source of Pierce's disease.

Phomopsis



Bleached spur with tiny raised black pimple-like pustules



Early Spring shoot infections first occur at the base of the shoot as individual spots.



The lesions coalesce to give the base of the shoot a scabby appearance.



Longitudinal cracks intermixed with bleached areas on a severely infected spur.



Cracks develop on the epidermis of the shoot as the lesions elongate



Basal leaves have chlorotic spots with a tiny black center.

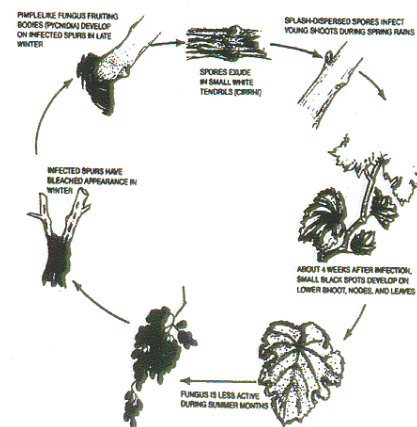
Phomopsis

DATE	WHAT TO LOOK FOR
December - February	When pruning look for whitish or bleached areas on the canes. These will have tiny raised black pimple-like pustules (fruiting bodies) that contain overwintering spores. In severe infections, growth was stunted the previous year and the basal 1"-6" of a cane will be covered with a black scab that has longitudinal cracks. The bleached areas will be intermixed with scabby areas. The base of these canes may be dead at the time of pruning – killed outright by the fungus or by normal winter temperatures.
February - March	The buds on severely infected spurs may not push. If rain occurs after bud break, all green tissue is susceptible to infection; however it will be several days before any signs of infection occur. About 3 weeks after rain occurs, small black dots with yellow margins begin to appear on the leaf blades as they expand. Infected spots on the shoot or cluster may be difficult to see at this time.

DATE	WHAT TO LOOK FOR
March-April	Heavy frequent rainfall will cause more infections and these will proceed to continue to damage the basal leaves, base of the shoot and all parts of the cluster. Basal leaves may become distorted because infected areas prevent normal expansion of the leaf tissue. If the petioles are infected, the leaves may abscise. Small oblong spots with black centers will appear on the base of the shoot. As the shoot elongates, lesions do as well causing the outer layer of green tissue to crack at the infection sites. Continued rainfall will cause large numbers of spots to eventually coalesce, resulting in a black scabby appearance. Internode length may be reduced in these areas thus the shoot will be stunted. Infections will only occur on the basal portion of the shoot. Similar spots may be present on any part of the cluster rachis or peduncle.

DATE	WHAT TO LOOK FOR
May-June	Dry weather will stop the growth of the fungus. New infections will only occur with rainfall. In windy areas, shoots that were stunted early in the season may break off near the base where most of the disease symptoms are present.
June-July	After leaf removal occurs, shoots with black, scabby basal internodes will be easier to see. The impact on clusters, if any, will also be more apparent.

Phomopsis Cane and Leaf Spot Cycle



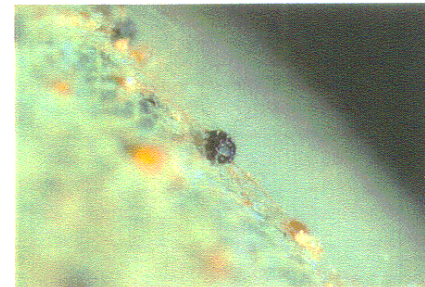
Powdery Mildew



- Early spring infections on underside of basal leaves.
- Light yellow colonies, about 1/4" diameter.



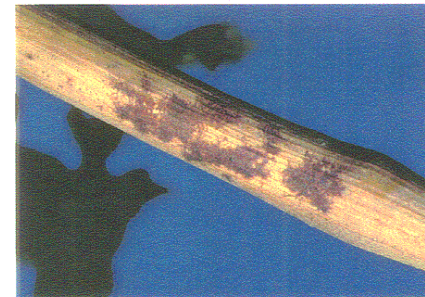
- Pre-veraison berry infections have dusty white appearance.
- Severe infections may stunt and crack berries.



- The overwintering fruiting bodies, cleistothecia, are formed on tissue that is severely infected in late summer.



- Conidiospores cause infections resulting in powdery, white mats of mycelia on the upper and lower leaf surfaces of shaded leaves.
- Similar looking infections will occur on shoots, petioles, and cluster parts.



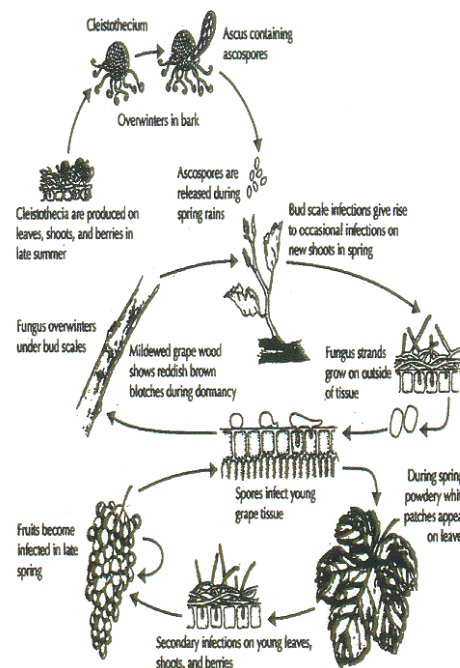
- Dormant canes have dark red blotchy marks in areas that were infected the previous growing season.

Powdery Mildew

DATE	WHAT TO LOOK FOR
February March	After budbreak, ascospores are released under conditions of mild temperatures (45-80°F) as well as light rainfall, frost protection, dew or fog that wets leaves continuously for 12-15 hours. About 6-9 days after these conditions occur, look for individual, pale yellow colonies, about 1/4" in diameter on the lower surfaces of basal leaves. Rare, but occasional "flag" shoots emerge from dormant buds.
April May	Follow temperatures and not leaf wetness after initial infections occur. Conidia production begins 7-10 days after primary infection. The optimum temperature for conidia to germinate is 77°F. Mycelium produced by these spores grows rapidly between 70-85°F. When a spore-to-spore generation can occur in 5 days. Look at the top and bottom sides of shaded leaves as well as cluster rachises and stems in dense canopies or in crowded, shoot positioned vertical canopies. Mats of hyphal strands cause mildew colonies to look like white powder. Select areas in the block that are renowned mildew hotspots or which are immediately adjacent to a severely infected vineyard.

DATE	WHAT TO LOOK FOR
June July	Overhead sprinkler irrigation, light summer rainfall and mild temperatures will lower inside canopy temperatures and increase mildew spore germination and infection. When temperatures remain between 70-85°F for at least 6 continuous hours for 3 consecutive days, the epidemic is initiated and the fungus is reproducing every 5 days. Look for powdery, white web-like mat of mycelial strands on any green, shaded tissue.
August	With the onset of veraison, new berry infections are reduced yet existing colonies can continue to grow on the fruit. Fruit cannot become infected when sugars reach 12°- 15°Brix.
September	When days become shorter and high temperatures are below 90° F, cleistothecia begin to form on the mycelial mats. Petioles, shoots and cluster parts are still susceptible. Late in the season, infection sites on the shoot turn black and look like webbing.
December	Dormant canes will have dark red, blotchy areas from the previous season's infections.

Powdery Mildew Cycle



Botrytis



- Clusters infected with early spring Botrytis.



- Leaf infection that has dried and become necrotic.



- Cluster infected late in the season with Botrytis.
- Intact berries may be infected in tight-clustered varieties.



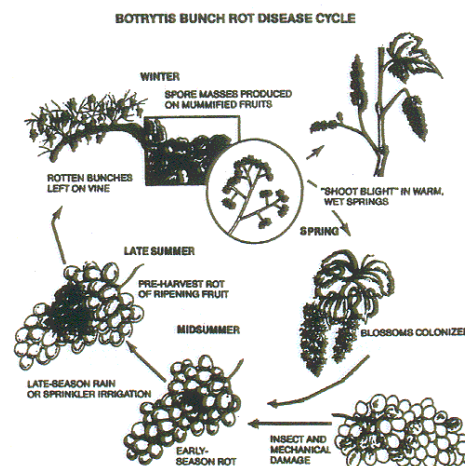
- Spores are formed on stalks of fungal tissue creating the appearance of fluffy gray mold.
- These spores will infect adjacent berries, as well as berries in nearby clusters.



- Botrytis grape mummies contain the overwintering structure of the fungus.
- Mummies produce spores after spring rainfall.

Botrytis

DATE	WHAT TO LOOK FOR	DATE	WHAT TO LOOK FOR
Bud break to bloom:	<ul style="list-style-type: none"> Cool, mild temperatures with persistent free water in the canopy. On any green tissue, infections will result in brown, water-soaked lesions. On a stem or petiole these become soft and spongy. If wet, mild conditions persist, then fluffy, gray spore masses ("gray mold") may be produced in these infection sites. On fully expanded leaf blades an infection may cover a few square inches; however young leaves close to the shoot tip may be entirely infected. Infected cluster parts will turn brown. All infected tissue will be killed and eventually dry up. <p>Plant parts that were infected the previous year – such as grape mummies – contain the overwintering structure of the fungus. After spring rainfall, spores are produced from these structures. The spores will germinate when there is free water on the foliage. The likelihood of infection is determined by both temperature and duration of free moisture – the longer wet conditions prevail, the greater the risk of infection. The optimum temperature for germination is 72°F. At 90°F or higher temperatures, the fungus cannot grow; however at 34°F it can grow although slowly. Rain, fog, heavy dew and overhead frost protection all result in free water in the canopy.</p>	Berry softening to harvest:	<ul style="list-style-type: none"> Infected berries become discolored (this is more noticeable in white varieties) and the berry skin easily slips off the pulp ("slip skin"). Cracks appear in the berry skin and these contain gray mold. Infection spreads throughout the berry and moves to adjacent berries. Infected cluster parts are covered with gray, fluffy spore masses that may contain green or black spores of other fungi. Late-season rainfall, under optimum temperatures, creates conditions whereby a complete generation (spore-to-spore) can occur in three days. Hot, dry conditions will cause infected berries to dry up, yet gray mold will reappear if wet weather occurs prior to harvest. <p>Although flower parts are infected around the bloom period, these infections remain latent until the berries begin to accumulate sugar at the onset of ripening. Free water is not required for berry infections. Berries with intact skin may become infected as well as those with skin that has been damaged by contact with adjacent berries, insect feeding, etc. Varieties with tight clusters are more susceptible to infection than varieties with loose clusters. Rainfall during the ripening period will cause the fungus to grow rapidly and produce more spores, thus leading to increased infection sites. If dry, warm weather occurs, some infected areas of the cluster dry up.</p>
<i>Botrytis Shoot Blight</i>		<i>Botrytis Bunch Rot</i>	

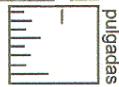


La Chicharrita De La Vid



Adulto

- Tienen 3mm (1/8 pulgada) de largo.
- De color amarillo pálido con marcas rojizas y castañas.
- Pasan el invierno como adultos.



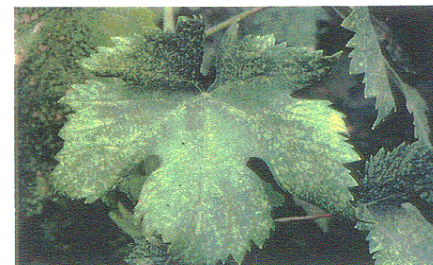
Ninfas

- Hay 5 estados juveniles.
- Las ninfas se encuentran principalmente en la parte inferior de la hoja.
- El tamaño varía de 0.8 mm cuando recién emergen a 2.5 mm durante el quinto estado juvenil.
- Caminan de costado como los cangrejos.



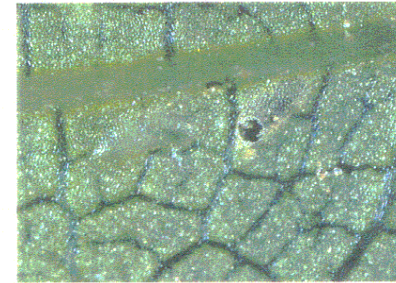
Descarte de la última piel

- Cuando el quinto estado juvenil cambia su piel para convertirse en adulto, la piel queda adherida a la hoja.
- Esto indica que los adultos han empezado a emerger, los cuales a su vez van a comenzar a depositar sus huevecillos comenzando una nueva generación.



Daño causado por la chicharrita de la vid.

- Al alimentarse sobre la hoja dejan pequeños puntitos amarillos.
- A medida que el daño progresa la hoja se torna amarilla.
- Las hojas pueden secarse y caerse.



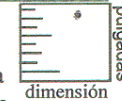
Huevecillos sanos y parasitados

- Izquierda: el huevecillo de la chicharrita de la vid tiene forma de riñón y son depositados dentro del tejido de la parte inferior de la hoja.
- Derecha: hay una pequeña avispa que parasita los huevos de la chicharrita. Cuando el parásito emerge del huevo deja un pequeño agujero redondo.



La arañita depredadora *Anystis* o arañita torbellino

- Esta pequeña arañita rojiza se alimenta de las ninfas de la chicharrita de la vid. Se le apoda torbellino debido a que camina rápidamente en círculos en busca de su presa.



Sonoma County Grape Growers Association
Fotos de Jack Clark, Universidad de California

Versión: Junio 2001

La Chicharrita De La Vid

Fecha	Estado del insecto	Que debe buscar
De principios a mediados de Mayo	Los primeros estadios de las ninfas de la primera generación	<ul style="list-style-type: none"> • Divida el viñedo en bloques para hacer el muestreo. • Las ninfas se encuentran en las hojas cerca de la base de la caña (las hojas más viejas) en la parte inferior de la hoja. • El daño comienza en las hojas que se encuentran en la base de la caña. • Elija 10 parras al azar para hacer el muestreo. Elija parras separadas de manera de obtener una muestra representativa del bloque. • Tome una hoja de la base de la caña en cada parra. Elija aquella hoja que tenga daño causado por la chicharrita de la vid. • Una vez por semana, cuente y registre el número de ninfas por hoja • Calcule el promedio de ninfas por hoja: sume el número total de ninfas en las 10 hojas y divida por 10.
De principios a mediados de Junio	El número pico de ninfas	<ul style="list-style-type: none"> • Continúe tomando 10 hojas de muestra una vez por semana • Mirando al follaje total de una parra evalúe que porcentaje de las hojas tienen daño. • Busque huevecillos que han sido parasitados (aquellos que tienen un pequeño agujero) para determinar si los parásitos están presentes en el viñedo.
De mediados a finales de Junio	La piel que fue descartada por el quinto estadio al convertirse en adulto	
Julio	Las ninfas de la segunda generación	<ul style="list-style-type: none"> • Las ninfas se encuentran en la parte inferior de la hoja en hojas que se encuentran en la mitad de la caña. • Tome una hoja por parra en 10 parras distribuidas por el bloque. • Tome una hoja que tenga daño causado por la chicharrita de la vid en la mitad de la caña. • Una vez por semana, cuente y registre el número de ninfas por hoja • Estime el daño causado por la chicharrita sobre el follaje total de la parra.
Antes de la cosecha	Adultos de la segunda generación	Estime la población de adultos

Arañitas



Araña Willamette



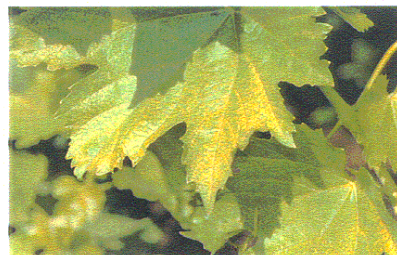
Araña Pacífica



Arañas dañinas

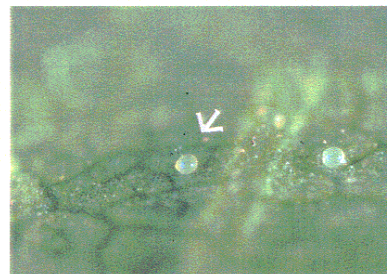
Hay dos tipos de arañas dañinas:
la Araña Willamette y la Araña Pacífica

- Tienen 0.5 mm de largo
- Los adultos poseen cuatro pares de patas
- El cuerpo es de forma ovalada de color amarillo pálido a color café rojizo
- Tienen pequeñas manchas de comida negras dentro del cuerpo hacia los costados.
- Poseen bellos pinchudos sobre el cuerpo



Daño causado por las arañas dañinas

- Estas arañas forman colonias en la parte inferior de la hoja.
- El daño comienza con una decoloración amarilla en una área en la parte superior de la hoja.
- A medida que el daño continua la hoja se torna color café y se seca, especialmente cuando hace calor.



Los huevecillos de las arañas dañinas

- Los huevecillos son redondos de color perla blanco.



La araña depredadora Occidental

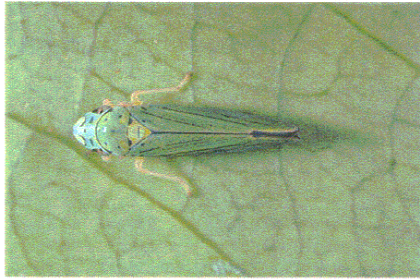


- El cuerpo tiene forma de pera o lágrima
- El color varia de blanco transparente a apenas rojizo
- Los adultos de la araña depredadora son un poco más grandes que las arañas dañinas
- Caminan muy rápidamente por la hoja y mueven constantemente el primer par de patas hacia arriba y abajo en búsqueda de su presa
- Se les puede encontrar escondiéndose en los ángulos de las venas

Arañitas

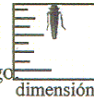
Fecha	Insectos	Que debe buscar
Desde Abril hasta la cosecha	Arañita Willamette Arañita Pacífica Arañita Depredadora	<ul style="list-style-type: none"> • Para hacer el muestreo, divida el viñedo en diferentes áreas, de acuerdo a las experiencias anteriores con arañas en dicho viñedo. • Aquellas áreas que históricamente han tenido problemas tienen que ser monitoreadas más frecuentemente. • Elija 10 viñas al azar para hacer el muestreo. Elija parras separadas de manera de obtener una muestra representativa del bloque. • En cada parra elija una hoja que tenga daño. • Examine la parte inferior de la hoja utilizando una lupa. • Aprenda a distinguir las arañas dañinas de las arañas depredadoras por la forma del cuerpo. • Busque con cuidado al lado de las venas y en las depresiones de la hoja. • Por cada hoja, anote la presencia o ausencia (+/-) de arañas dañinas y de arañas depredadoras. Se establece presencia cuando se encuentra una o más arañas. Ausencia es la falta de ese tipo de araña. • Sume las hojas que contienen una o más arañas dañinas. • Sume las hojas que contienen una o más arañas depredadoras. • Divida el número de hojas con arañas dañinas por el número de hojas con arañas depredadoras para obtener la proporción de arañas dañinas a arañas depredadoras.

Chicharritas



**La chicharrita verde-azulada
(Blue-Green Sharpshooter)**

- Tiene 7 mm (1/4 pulgada) de largo.
- De color verde oscuro a verde azulado.
- Tienen pequeñas marcas negras sobre y detrás de la cabeza.
- Poseen un triángulo amarillo en el medio entre las alas.
- El vientre por debajo es de color amarillo.
- Tienen una generación al año.
- Habitan y se alimentan de plantas leñosas.



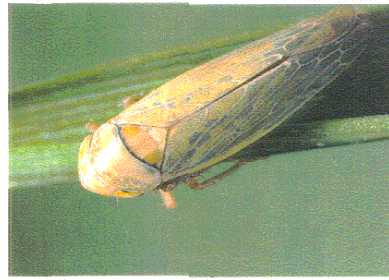
pulgadas
dimensión



La ninfa de la chicharrita verde-azulada

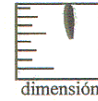
- Hay cinco estados juveniles.
- Las ninfas son de color blanco.

*Sonoma County Grape Growers Association
Fotos de Jack Clark, Universidad de California*



**Aprenda a distinguir esta
chicharrita que es parecida
pero que no es una plaga**

- Esta chicharrita es atraída a las trampas amarillas donde puede ser confundida con la chicharrita verde-azulada pero no es una plaga.
- Esta chicharrita habita en los pastos.
- Es aproximadamente del mismo tamaño que la chicharrita verde-azulada.
- Es de color verde pálido.
- El triángulo en medio de las alas es verde pálido del mismo color que las alas.
- No tiene marcas negras sobre la cabeza.
- El vientre por debajo es de color crema con una zona color café en el centro.
- Cuando revise las trampas no confunda a esta chicharrita. **No la cuente.**



pulgadas
dimensión



**La chicharrita de alas cristalinas
(Glassy-winged sharpshooter)**

- Tiene 13 mm (1/2 pulgada) de largo.
- De color café con el vientre por debajo de color crema.
- La parte superior de la cabeza está cubierta de pequeñas manchas amarillas.
- Las alas son translúcidas con venas rojas.
- Habitan y se alimentan en árboles, arbustos y hierbas.



pulgadas
dimensión



**La ninfa de la chicharrita de alas cristalinas
(Glassy-winged sharpshooter nymph)**

- Hay cinco estados juveniles.
- Las ninfas son color gris oliva y tienen un par de ojos rojos saltones.

Versión: Junio 2001

Chicharritas

Chicarrita Verde-Azulada

Fecha	Estado del insecto	Que debe buscar
Marzo a Mayo	El adulto de la chicharrita verde-azulada	<ul style="list-style-type: none"> • Coloque trampas pegajosas amarillas antes que la viña comience a brotar. Ponga las trampas al borde del viñedo adyacente a la vegetación de los arroyos, montes y jardines. • Ponga una trampa cada 100 a 200 metros. • Revise las trampas por lo menos una vez a la semana. • Cuente el número de chicharritas por trampa y mantenga un registro. • Quite las chicharritas de la trampa luego de ser contadas. • Cambie las trampas cuando hayan perdido el pegamento.
De mediados de Abril hasta finales de Julio	La ninfa de la chicharrita verde-azulada	<ul style="list-style-type: none"> • Busque a las ninfas de la chicharrita verde-azulada en sus plantas preferidas en las orillas del viñedo. • Inspeccione las plantas usando una red para atrapar insectos. • Vierta el contenido de la red dentro de una bolsita de plástico para poder inspeccionar los insectos sin que se escapen

Chicarrita de Alas Cristalinas

Fecha	Estado del insecto	Que debe buscar
De Marzo hasta fines de Noviembre	El adulto de la chicharrita de alas cristalinas	<ul style="list-style-type: none"> • Antes que la viña comience a brotar, coloque las trampas pegajosas amarillas a la orilla del viñedo adyacente a la vegetación de los arroyos, montes y jardines. Elija las trampas más grandes porque contienen más pegamento. • Ponga el número de trampas que usted va poder inspeccionar regularmente. • Revise las trampas por lo menos una vez a la semana. • Mantenga un registro aunque no encuentre ninguna chicharrita. • Cambie las trampas cuando hayan perdido el pegamento.

Cenicilla Polvorienta



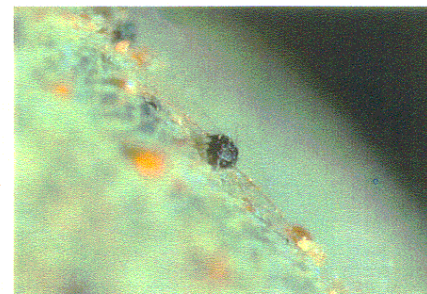
- Infección que ocurre temprano en la primavera en la parte inferior de la hoja.
- Las colonias son de color amarillos de aproximadamente 1/2 centímetro de diámetro.



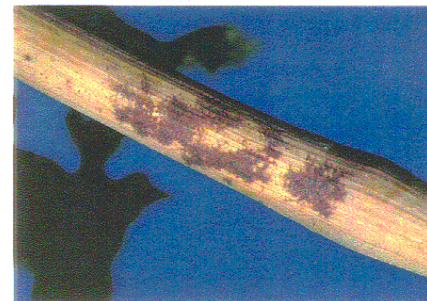
- El hongo forma filamentos blancos de aspecto polvoriento que infectan la parte superior e inferior de aquellas hojas que se encuentran en la sombra.
- Infecciones similares ocurren en los brotes, el tallo de la hoja, y en los racimos.



- Infecciones en la uva ocurren antes que maduren y las uvas se cubren con un polvo blanco.
- Serias infecciones pueden impedir el crecimiento de la uva y causar que se requiebren.



- A finales del verano, en aquellas plantas que están severamente infectadas, el hongo forma pequeños cuerpos negros los cuales sobreviven durante el invierno



- Cuando la caña madura las infecciones se tornan en manchas rojizas.

Cenicilla Polvorienta

Fecha	Que debe buscar
Febrero Marzo	Después que la vid comienza de brotar, y bajo de condiciones moderadas de temperaturas (entre los 7 a los 26°C [45-80°F]) y de humedad (cuando las hojas permanecen mojadas por 12 a 15 horas debido a una lluvia o durante la protección contra heladas o durante periodos de rocío o neblina), el hongo libera esporas. Aproximadamente 6 a 9 días después de ocurridas estas condiciones, busque (en la parte inferior de las hojas que se encuentran en la base de la caña) a las colonias redondas de color amarillo de 1/2 centímetro de diámetro.
Abril Mayo	Después de la primera infección preste atención a la temperatura. La temperatura óptima para el crecimiento del hongos es entre los 21 y los 29°C (70-85°F). Busque las manchas de polvo blanco, en la parte superior e inferior de hojas que se encuentran a la sombra, así como en racimos y tallos. Inspeccione áreas que tienen una historia de tener cenicilla o que se encuentran adyacentes a viñas que están infectadas.
Junio Julio	El uso de irrigación sobre el follaje, las lluvias ligeras del verano, y temperaturas moderadas causan que la temperatura dentro del viñedo decrezca obteniendo condiciones propicias para la germinación de las esporas e infección de la planta. Cuando las temperaturas permanecen entre los 21 a los 29°C (70-85°F) por un mínimo de 6 horas continuas durante 3 o más días el hongo se reproduce cada cinco días. Busque manchas blancas polvorientas en cualquier parte de la vid que se encuentra a la sombra.
Agosto	Cuando la fruta comienza a madurar deja de ser susceptible a nuevas infecciones. Sin embargo, infecciones existentes continúan creciendo en la fruta. La fruta no puede ser infectada cuando la concentración de azúcar llega a los 15° Brix.
Septiembre	Los pequeños cuerpos negros comienzan a formarse cuando los días comienzan a acortarse. Los tallos, retoños y partes del racimo continúan siendo susceptibles a infecciones. Al final de la estación, las infecciones en las cañas forman manchas negras de aspecto fibroso.
Diciembre	Las infecciones permanecen como manchas rojizas en la caña durante el reposo invernal.

Powdery Mildew Cycle

